

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-17 and Species A1, A2, and B3 in the reply filed on 9/29/2009 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 12 and 18-34 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group and Species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 9/29/2009.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the work piece being directly electrically connected to the magnetron sputter cathode must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure

is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:
 - a. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "the resistor". There is insufficient antecedent basis for this limitation in the claim.

5. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "short connected" in claim 10 is used by the claim to mean 'a break in the electrical connection', while the accepted meaning is possibly "short-circuited" or 'disconnected'. The term is indefinite because the specification does not clearly redefine the term.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-11 and 13-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Saigal et al (USPGPub 2004/0112735).

With respect to claims 1, 3-5, and 16, Saigal et al discloses pulsed magnetron for sputter deposition for depositing metal (abstract; fig. 7), where fig. 5 depicts a vacuum chamber [142], a sputter (i.e. argon) gas [314], a reactive gas [343], and a chamber

shield [166] that acts as an anode (p. 3, para 0037). Fig. 6 depicts pulsed discharges at a source [200] between first electrodes comprising a target (i.e. cathode) [146] and the anode [166], with a pulsing RF potential comprising a pulsed current also applied to second electrodes comprising a work piece (i.e. wafer) [148] and the anode [166] (p. 4, para 0046). The pulsing discharges and the RF potential are applied simultaneously (p. 4, para 0046), thus said pulsing discharges and RF potential appear with the same frequency. Saigal et al also discloses that when the pulsed discharge (i.e. DC voltage) is applied between the target [146] and the anode [166] to ignite the argon gas into a plasma, positively charged argon ions strike said target [146] causing atoms or atomic clusters (i.e. blobs) to be sputtered from said target [146] (p. 5, para 0055).

With respect to claim 2, Saigal et al further discloses the anode [166] builds up deposited material (i.e. blobs) during sputtering (p. 5, para 0050), with a DC component on said anode [166] in addition to the RF potential bias on the wafer [148] (p. 4, para 0038 and 0046).

With respect to claim 9, Saigal et al further discloses a voltage to the target [146] between 400 to 600 volts, with a target power of 0.1 to 5 kW (p. 4, para 0038). Using the well known equation $\text{Power} = \text{Voltage}^2 / \text{Resistance}$ and 400 volts with 0.1 kW as a low endpoint range and 600 volts with 5 kW as a high endpoint range yields a resistance range, and thus a resistor being present, of approximately 0.072 k Ω to approximately 1.6 k Ω .

With respect to claim 6, Saigal et al further discloses a DC potential superimposed on the RF potential (p. 4, para 0046), thus the potential applied to the wafer [148] is the same as the potential applied to the target [146].

With respect to claim 7, Saigal et al further discloses in fig. 6 a controller [224] directly electrically connected to the wafer [148] and the target [146], with fig. 7 depicting a first period (i.e. either pulse low or pulse high) of the pulse between said target [146] and the anode [166]. Since the wafer [148] is biased simultaneously during sputtering (p. 4, para 0046), said wafer [148] is biased during a first period.

With respect to claim 8, Saigal et al further discloses in fig. 6 the wafer [148] electrically connected to the target [146] via a wire. The wire acts as a resistor since said wire has some degree of resistance.

With respect to claims 10-11 and 13, Saigal et al further discloses each cycle comprising one pulse high interval and one pulse low interval has a duration of 0.1 s (p. 4, para 0043). Saigal et al also discloses the wafer [148] is electrically floating (p. 4, para 0046).

With respect to claims 14-15, Saigal et al further discloses in fig. 6 the controller [224] to periodically connect the wafer [148] and the anode [166] through a resistor (i.e. wire) (p. 5, para 0048), where using the well known equation $\text{Power} = \frac{\text{Voltage}^2}{\text{Resistance}}$ and 30 volts with 10 W as a low endpoint range and 30 volts with 5 kW as a high endpoint range yields a resistance range, and thus a resistor being present, of approximately 0.00018 k Ω to approximately 0.09 k Ω .

With respect to claim 17, Saigal et al further discloses the wafer [148] having a bias of approximately 30 volts (p. 4, para 0046).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 9am-5pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 1795

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